# LOUDOUN COUNTY, VA
# TECHNICAL REVIEW

## PROPOSED
## NEW

# 85-FOOT STEALTH SILO
## by
## NEXTEL COMMUNICATIONS

## Nextel Site ID: VA3451F/WA73XC267
## (Raspberry)
## CMPT 2005-0007
## SPEX 2005-0037

## Submitted by:


## ATLANTIC TECHNOLOGY CONSULTANTS, INC.
A Member of The Atlantic Group of Companies


## ATC PROJECT #: 1025-14

**November 2, 2007**

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## EXECUTIVE SUMMARY:

Nextel Communications of the Mid-Atlantic, Inc. ("Nextel") of Columbia, Maryland has submitted an application to Loudoun County requesting a Special Exception and Commission Permit to construct an 85-foot stealth silo on property owned by Rockland Farm LLC (Betsy Brown) located on Rockland Farm approximately 500' east of James Monroe Highway (Route 15) and approximately 0.9 mile north of intersection of Whites Ferry Road (Route 655) at 16306 Rockland Lane, Leesburg, VA.

Nextel, also known as Sprint/Nextel is a FCC licensed telecommunications provider authorized and mandated to provide wireless communications services to the Loudoun County area. Nextel is proposing an 85' stealth silo ("silo") to support service delivery in an area of verifiable lack of coverage along James Monroe Highway (Route 15) near the intersection with Whites Ferry Road (Route 655).

This report outlines the specific areas of evaluation with respect to this proposal, and this consultant's recommendations regarding the Application package as presented. Supporting and clarifying evidence regarding the suitability of the proposed design in meeting the specified coverage goals is also included.

In general, it is the opinion of this consultant that this application conforms to all Federal, State, and County regulations regarding the construction of telecommunications support structures, represents a sound design, and should be considered for approval contingent upon the criteria noted in Section 3.0 "Recommendations" of this document.

*George N. Condyles. IV*

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George N. Condyles, IV
President and COO
Atlantic Technology Consultants, Inc.

## 1.0 TECHNICAL:

### 1.1 Siting

The proposed tower site is a 57' x 40' lease area on approximately 2,400 square foot portion of a 485.75 acre parent parcel. The property is zoned AR-1 (Agricultural Rural-1) and located on Tax Map 40 Parcel 1C (MCPI # 143-36-5724). The proposed site, located North of Leesburg on the east side of James Monroe Highway (Route 15) and approximately 0.9 miles north of intersection of Whites Ferry Road (Route 655), can be accessed off of Rockland Lane and is physically located at coordinates N 39° 09' 54.903" and W 77° 32' 01.993" at a ground elevation of 253.79' AMSL at base.

The Applicant is proposing to construct an 85' x 21'stealth silo, which can accommodate up to three (3) co-locators. The site compound could accommodate approximately three (3) 12'x20' shelters and a 6'x10' concrete pad. Nextel proposes a total of 12 antennas, 4 GPS antennas, 3 TTA's, 15 lines of 1 5/8" coax and an icebridge. The Nextel equipment shelter will be designed as a farm building with white board on board siding and a green metal siding and tin roof. The Compound and Elevation Plan (Sheet Number Z-3) indicates that the antennas will be mounted exteriorly to the structure. According to the Speical Exception Conditions of Approval February 28, 2007, condition #5:

"All antennas shall be mounted on the exterior of the silo and shall be painted to blend with the exterior of the silo."

**This Consultant would recommend a stealth silo design similar to the one proposed in Nextel's Philomont Application (CMPT 2002-0017; SPEX 2002-0032). The Nextel-Philomont Application is proposing a concrete silo with a fiberglass silo cap. The purpose of the fiberglass silo cap is to allow the antennas to be mounted to the interior of the structure. This design would be considered a "true" stealth silo. Sample pictures of stealth silos similar to the one being proposed in the Nextel-Philomont Application are attached to this report.**

**Setback:**

The tower complies with the County's setback requirement that "…towers shall be set back one (1) foot for every five (5) feet in height from the property line." [Loudoun County 1993 Zoning Ordinance, Section 5-618 (C) (3) (e)] In other words, it is a 20% setback requirement. The Site Plan submitted with this Application shows the proposed 85' silo setback from the nearest property line approximately 468.8', which is 552% of the height of the tower and greater than the ATC recommended 110% setback.

The nearest occupied dwelling to the silo is approximately 750', which achieves the ATC recommendation of 750' setback from a residence.

**Geotechnical:**

The proposed tower site location is located in a limestone conglomerate area, a karst geology that is highly susceptible to rock outcrops, solution channels, and sinkholes. The County is requiring a detailed geotechnical study be submitted at site plan.

Under Loudoun County's March 19, 2007 Planning Commission Public Hearing Staff Notes "Summary of Discussion", "Environmental" it states:

> "The applicant will be required to submit a detailed geotechnical study at site plan, due to the subject site's location in the limestone conglomerate area."

**ATC recommends a required geophysical analysis be performed prior to special exception approval, which is the same requirement set forth by the County for the CWS #101 – White's Ferry site.**

**Landscape Buffer:**

The County is recommending an additional buffer to better screen the proposed silo from adjoining properties and James Monroe Highway (Route 15), a designated Virginia Scenic Byway.

Under Loudoun County's March 19, 2007 "Special Exception Conditions of Approval" item condition number 7 indicates:

> "The applicant shall utilize existing mature vegetation along James Monroe Highway (Route 15) to create a 200-foot Landscape Buffer which shall be designated as a Tree Conservation Area (TCA) in the location shown on the SPEX plat. The applicant shall submit a Tree Conservation Plan for the TCA at site plan and shall conduct annual monitoring of the TCA for potential disease and insect damage for the duration of the commercial public telecommunication use. The applicant and property owner reserves the right to remove, in consultation with the County Urban Forester, any dead, damaged, dying or diseased trees and vegetation in the TCA. Any tree deemed necessary for removal from the TCA which are greater than 8-inch in caliper, shall be replaced with two trees, a minimum of 3-inch caliper, in order to maintain the integrity of the landscape buffer. The species and location of such replacement trees shall be determined by the applicant's certified arborist in consultation with the County."

**Co-Location:**

While co-location is preferable to construction of a new site, with such co-location minimizing visual impact of telecommunications equipment on the surrounding

area, there are currently no existing structures within a 2-mile radius on which to co-locate. The nearest telecommunications facility is 3 ½ miles to the north (Luckett's Fire Station) and 3 miles to the south (Town of Leesburg). Nextel has designed the silo to accommodate up to three (3) co-locations.

1.2 Structural

The proposed 85' stealth silo is designed to mimic traditional agricultural silos and shall be constructed of concrete with a metal domed roof. **However, as mentioned in the previous section of this report, the proposed silo indicates the antennas will be mounted exterior to the structure. Therefore, it is NOT a true stealth design.**

**As previously mentioned. this Consultant recommends a stealth silo design similar to the one proposed in Nextel's Philomont Application (CMPT 2002-0017; SPEX 2002-0032). The Nextel-Philomont Application is proposing a concrete silo with a fiberglass silo cap. The purpose of the fiberglass silo cap is to allow the antennas to be mounted to the interior of the structure. This design would be considered a "true" stealth silo. Sample pictures of stealth silos similar to the one being proposed in the Nextel-Philomont Application are attached to this report.**

**Structural drawings of the stealth silo signed/sealed by a Professional Engineer licensed in the Commonwealth of Virginia demonstrating the structure's ability to structurally accommodate the antennae and associated appurtenances of three (3) co-locations, while complying with all applicable construction and loading standards, guidelines, and codes has NOT been submitted with the Application.**

The silo design shall be in full compliance of the EIA/TIA-222-F guidelines (the accepted industry standard) for structures, which is mandated to withstand the structural loading of all appurtenances, plus additional wind and ice loading.

Furthermore, in conformance with County ordinance, work at this site will remain in compliance with ALL federal, state, and local building codes and regulations if work proceeds as outlined in the application.

1.3 RF Exposure

FCC bulletin OET-65 provides guidance for a licensee proposing to construct a telecommunications support structure in calculation of RF exposure limitations, including analysis of the cumulative effect of all transmitters on the structure. Appropriate steps, including warning signage at the site, must be taken to protect both the general public and site workers from unsafe RF exposure in accordance with federal guidelines.

**Documentation of an RF exposure study is NOT included with this application; therefore it is assumed that this study has not been performed.**

**Although this Consultant sees no evidence of unsafe RF exposure levels being generated at this site if co-location were to proceed as proposed, a certified RF Analysis Report is recommended.**

RF site exposure warning signage placement shall be appropriately planned for this site.

1.4 Grounding

Grounding of all structures and equipment at an RF site is critically important to the safety of both personnel and equipment at the site. Even a single component not meeting this standard places all other site components at risk for substantial damage. All structures and equipment at the site should maintain a ground potential difference of less than 5 ohms.

**A grounding plan was NOT submitted with this Application.**

1.5 General Safety

The 57'x40' site compound is bordered on one side by an existing barbed wire fence, however the Compound Plan and Elevation (Sheet Number Z-3) does not indicate a security fence surrounding the compound. Therefore, this Consultant recommends the Applicant install an 8' wooden security fence surrounding site compound to prevent unauthorized access to the silo and ground equipment.

Additional safety measures to be placed at this site include RF exposure warning signage, site identification information, and routine and emergency contact information and FCC Registration number.

The Permit Plans should include the installation of an OSHA-approved style of fall prevention cable.

1.6 Interference

An interference study, taking into account all proximally located transmitters and receivers known to be active in the area, is advisable prior to any new tower construction. A full interference study has not been included with the Applicant's design, and therefore it is assumed that such a study has not been performed. While it remains technically prudent and advisable to complete this study for any co-location, practically speaking this consultant sees no evidence of interference by or with this site after a general evaluation of the surrounding transmitter sites.

Should any interference issues be posed with respect to this site, mitigation would nevertheless remain the responsibility of the tower owner and affected carrier(s), and would be regulated by the Federal Communication Commission, having no effect or burden on the County.

## 2.0 PROCEDUREAL

### 2.1 FAA Study

The Applicant submitted an Airspace Report dated August 11, 2006 that indicates no impact, thus no action is necessary.

In addition a search was performed by this consultant via TOWAIR Determination under the ASR online system on the FCC website to determine if registration is required. The TOWAIR determination results were as follows:

"Structure does not require registration. There are no airports within 8 kilometers (5 miles) of the coordinates you provided."

### 2.2 FCC Antenna Site Registration

This site does not yet have, nor is it required to have, an antenna site registration number. For both routine and emergency identification purposes, however, it is recommended that this site be registered with the Federal Communication Commission. All registered sites should have their registration number conspicuously displayed at the site which is normally on the security fence surrounding the compound area.

### 2.3 Environmental Impacts

The National Environmental Policy Act of 1969 (NEPA), delineated in Title 47 of the Code of Federal Regulations, Part 1, Subpart I, sections 1.1301-1.1319, requires federal agencies to incorporate environmental considerations into their decision-making process when evaluating new construction proposals. As a licensing agency, the Federal Communication Commission (FCC) requires all licensees to consider the potential environmental effects from their construction of antenna support structures, and to disclose those effects in an Environmental Assessment (EA) that must be filed with the FCC for review.

**A full NEPA Phase I Report dated May 15, 2006 and performed by EBI Consulting has been submitted with the Application. Upon this Consultant's review of the Report, there isn't any indication of an adverse impact from any of the consulting agencies. According to EBI Consulting, "Based upon the results of our assessment, it appears that the proposed installation will not adversely impact any of the criteria as outlined in**

**1.1307(a) items (1) through (8) [NEPA Checklist] and preparation of an Environmental Assessment (EA) is not required."**

A NEPA Phase I Report should include the following items:

- NEPA Checklist
- NEPA Summary Report
- Associated documentation
    - Figures, Drawings, Maps
    - Tribal Correspondence
    - Land Resources Map and FEMA Floodplain Map
    - SHPO Correspondence (See next Section 2.4 "Historic Impacts)
    - Department of Game and Inland Fisheries Response
    - Department of Conservation and Recreation Response

The NEPA Phase I Assessment is a report that is submitted to the FCC only if requested by the FCC. Otherwise, it shall be reviewed by the appropriate locality for which the proposed tower site is being considered for approval.

## 2.4 Historic Impacts

Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires that State Historic Preservation Offices (SHPO) and the President's Advisory Council on Historic Preservation be given a reasonable opportunity to comment on all undertakings with the potential to affect historic properties. The licensee is required to submit to the SHPO a detailed description of the project, a listing of local historic resources, and a discussion of any measures being undertaken to mitigate impacts (if any) on historic resources. Upon receipt, the SHPO has thirty (30) days to review and respond to those submissions. All agencies with authority to permit construction are required to consider the SHPO response in its decision making process with respect to new construction applications.

**A response dated May 8, 2006 from the Virginia Department of Historic Resources (VDHR) was submitted with the Application. VDHR's response is the following:**

**"This project will have an effect on historic resources. Based on the information provided, the effect will not be adverse."**

**Under Comments it states, "Our judgment is conditioned on the stealth silo's new height of 85 feet."**

## 2.5 Supporting Documentation

The Applicant has included documentation supporting the construction of the proposed site in the form of propagation mapping.

An independent RF analysis has been performed by this consultant, with a coverage map appended to this report, verifying that the applicant will be able to meet their stated coverage objectives as proposed.

**Supporting documentation in the form of photo-simulation was submitted with the Application. This Consultant believes the photo-sims are an accurate representation of the silo from various locations at a significant distance surrounding the proposed site, however as the silo is being proposed in the site plans with the antennae mounted exteriorly it would have a visual impact at distances closer to the structure.**

2.6 Pending CWS #101 – White's Ferry Application

Another site being considered for approval in this same area is a proposal submitted by Community Wireless Structures ("CWS") to construct two (2) 90' stealth monopoles ("monopines") on property located in the southeast quadrant of the intersection of James Monroe Highway (Route 15) and Rocky Meadow Lane (Route 9), at 42353 Rocky Meadow Lane. The CWS Application was submitted after the Nextel Application.

***ATC contends that the Nextel silo is a superior application to the CWS stealth monopine recommended approximately ¼mile to the north.***

## 3.0 RECOMMENDATIONS

This application represents an appreciable intent on the part of the Applicant to conform to all applicable federal, state, and local regulations, accepted industry practices, and specific County ordinances regarding construction of new telecommunications towers. It is therefore the recommendation of this Consultant that the County consider the Applicant's proposal contingent upon the following criteria being submitted for review prior to final approval:

- A geotechnical and geophysical analysis of the development site;
- Structural Drawings of a stealth concrete silo with a fiberglass silo cap;
- New site plans of a "true" stealth silo showing the antennas mounted to the Interior of the structure and an 8' high wooden security fence surrounding the site compound;
- Grounding specifications;

- A certified RF Analysis Report;
- Any landscape buffer issues resolved

**In addition, it is the opinion of this Consultant that if the above-mentioned criteria is met, then it is recommended that the proposed Nextel 85' Silo at Rockland Farm be considered for approval.**

**If the CWS site is approved, it should be for one (1) tower. The combined Co-location potential for both the silo and the monopine would be 6 co-locators. If more capacity for co-location is required, then the second monopine for CWS "White's Ferry" could be approved.**

In closing, this consultant remains available to address any comments or questions which may arise after review of this report. Any interested party with such comments or questions may feel free to contact this firm, which remains committed to delivering independent, objective, unbiased, and thorough consulting services.

Respectfully submitted,

*George N. Condyles IV*

George N. Condyles, IV
President & COO

**Approximate Location of Proposed Silo**

**Rockland Mansion**

**30’ Pine Trees along Rt. 15 –Buffer**

**Closest off Site Residence**

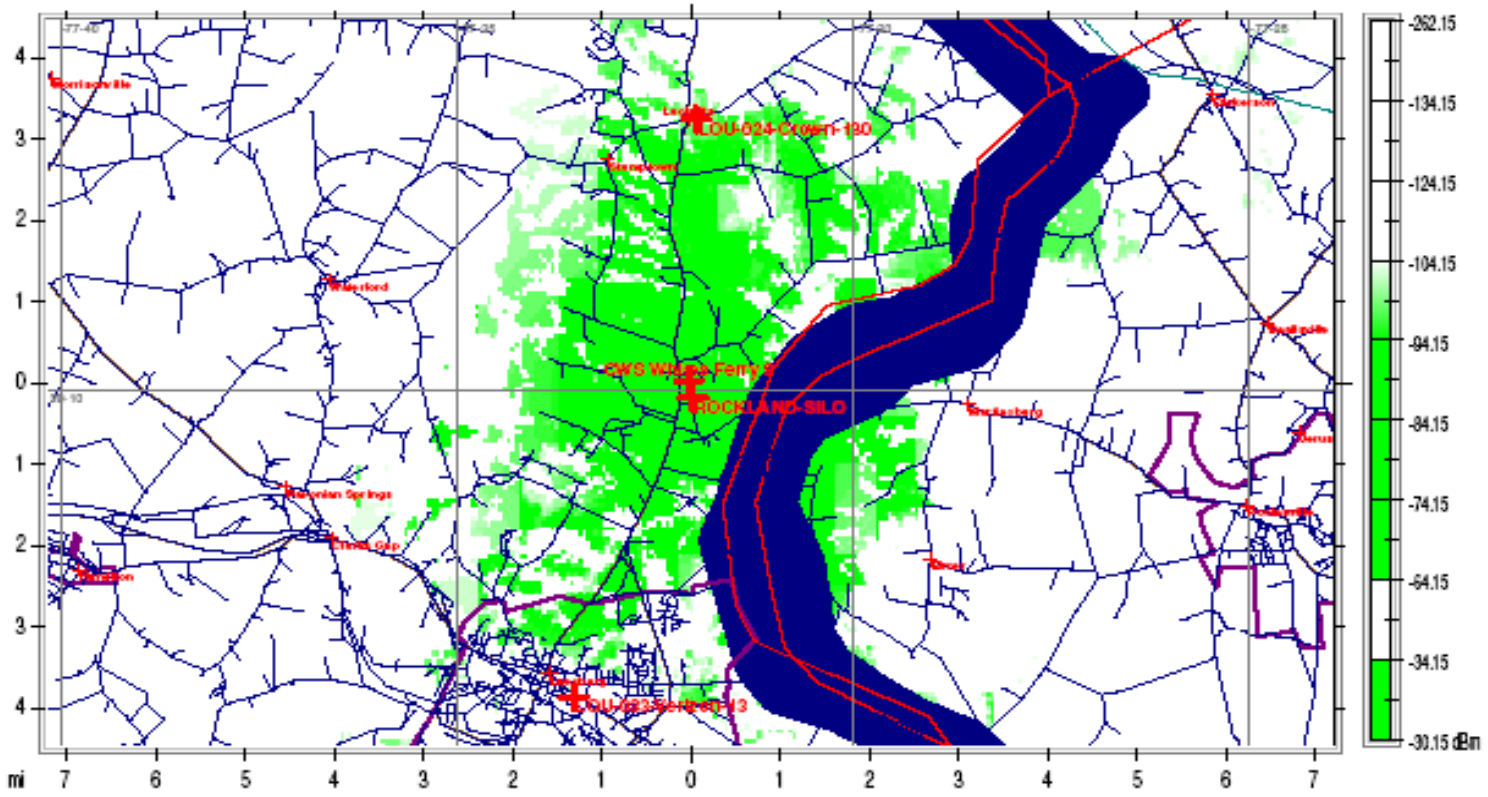
**Agricultural Operation**

**Antennas Concealed Inside of Silo**

**Fauquier County**

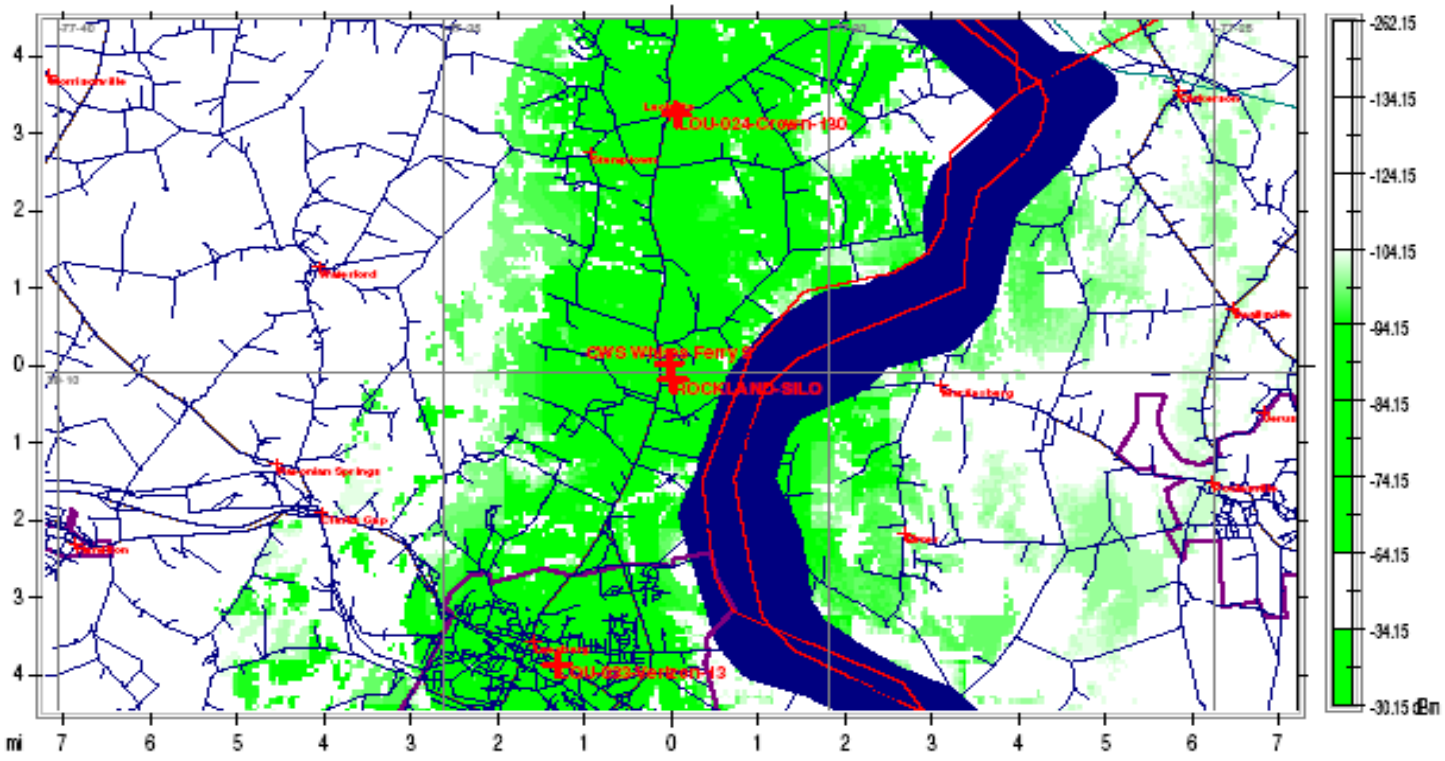
**Existing silo – Philomont area – 80' AGL**

LOUDON COUNTY, VIRGINIA




ROCKLAND SILO-80' AGL

LOUDON COUNTY, VIRGINIA




LOU-033 & LOU-024 & ROCKLAND -SILO

**SAMPLE STEALTH SILO**

# SAMPLE STEALTH SILOS

# Antenna Structure Registration



## TOWAIR Determination Results

HELP

New Search Printable Page

### *** NOTICE ***

TOWAIR's findings are not definitive or binding, and we cannot guarantee that the data in TOWAIR are fully current and accurate. In some instances, TOWAIR may yield results that differ from application of the criteria set out in 47 C.F.R. Section 17.7 and 14 C.F.R. Section 77.13. A positive finding by TOWAIR recommending notification should be given considerable weight. On the other hand, a finding by TOWAIR recommending either for or against notification is not conclusive. It is the responsibility of each ASR participant to exercise due diligence to determine if it must coordinate its structure with the FAA. TOWAIR is only one tool designed to assist ASR participants in exercising this due diligence, and further investigation may be necessary to determine if FAA coordination is appropriate.

**DETERMINATION Results**

**Structure does not require registration. There are no airports within 8 kilometers (5 miles) of the coordinates you provided.**

**Your Specifications**

| | |
|---|---|
| **NAD83 Coordinates** | |
| Latitude | 39-09-54.9 north |
| Longitude | 077-32-01.9 west |
| **Measurements (Meters)** | |
| Overall Structure Height (AGL) | 25.9 |
| Support Structure Height (AGL) | 25.9 |
| Site Elevation (AMSL) | 77.4 |

**Structure Type**

TOWER - Free standing or Guyed Structure used for Communications Purposes

**Tower Construction Notification**
Notify Tribes and Historic Preservation Officers of your plans to build a tower.
Note: Notification does NOT replace Section 106 Consultation.



Federal Communications Commission
445 12th Street SW
Phone: 1-877-480-3201
TTY: 1-717-338-2824